**Genetic variation and molecular authentication of selected Aquilaria species from natural populations in Malaysia using RAPD and SCAR marker.**


## ABSTRACT

Aquilaria (Thymelaeaceae) is an endangered agarwood-producing tropical tree that is endemic to the Indomalesia region. Molecular information on genetic diversity of Aquilaria is limited. The aims of this research were to study genetic diversity among three Aquilaria species, growing in natural and distant populations in Malaysia using RAPD markers and to develop SCAR markers for easy identification of A. malaccensis, the major agarwood producer. By analyzing 23 RAPD primers, a total of 368 bands were scored. Multi-populations Descriptive statistics revealed that 333 (90.49%) polymorphic bands were found at species level, where A. malaccensis had 107 (29.08%) bands, A. hirta had 56 (15.22%) and Aquilaria sp.1 had 11 (2.99%), for the percentage of polymorphic loci in a single population/species. Nei's unbiased measurement indicated moderate similarities among populations/species. Out of the 23 RAPD primers, three were found specific to A. hirta and one was specific to each A. malaccensis and Aquilaria sp.1. RAPD-based SCAR markers generated a total of five species-specific amplicons: three for A. hirta, one each for A. malaccensis and Aquilaria sp.l. SCAR markers for A. malaccensis were used to distinguish five other different A malaccensis populations in Malaysia. SCAR markers for A. malaccensis tested in five other different A. malaccensis populations in Malaysia yielded positive and consistent results. The DNA fingerprints identified for each Aquilaria sp. will be useful for Aquilaria identification in natural population, young plantation and even at seedling and seed stages in the nursery, as it is rapid and cost-effective and does not rely on morphology.



**Keyword:** Agarwood; Aquilaria; Genetic variation; Genetic distance; Molecular markers.